DP562 Multichannel Dolby Digital Decode Quick Start Guide

Decoding Modes

The DP562 supports four decoding modes, selected through a combination of the two, left-most upper row buttons, labeled Dolby Digital and Dolby Pro Logic. The four supported modes are:

- **Dolby Digital**: up to 5.1-channel (Dolby Digital) bitstream decoded.
- **Dolby Pro Logic**: two-channel, stereo compatible Dolby Surround (Lt/Rt) bitstream decoded into a 4-channel surround output (left, right, center and mono surround).
- **Dolby Digital + Pro Logic**: A) Decodes a two-channel, Dolby Surround (Lt/Rt) encoded Dolby Digital input signal into a four channel surround output (L, C, R,S) ***or*** B) Decodes and downmixes up to a 5.1-channel Dolby Digital input signal into two-channel Dolby Surround (Lt, Rt), and decodes that into a four-channel surround output (L, C, R, S).
- **PCM**: pass through mode (bypass).

Refer to the ***DP562 User's Manual***, Section 4.2 for more detailed information.

Bass Redirection

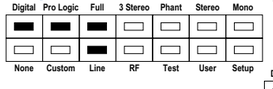
The Bass Redirection menu within the DP562 allows the user to redirect low frequency information from any of the five main speaker channels to the Sub Bass output, or LFE channel information to the Left and Right outputs. The DP562 incorporates similar bass management functions as a consumer Dolby Digital Decoder, and thus aids in consumer decoder emulation and confidence testing of Dolby Digital bitstreams.

Refer to Section 3.2.3 of the ***DP562 User's Manual***, and the ***Dolby Digital Professional Encoding Manual***, ***www.dolby.com/digital*** for more detailed information.

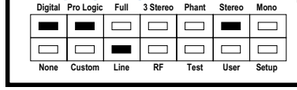
Set Up Examples

Home Theatre, 5.1:

5.1 Downmix, Surround Pro Logic decode emulation:

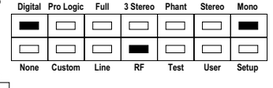


5.1 Downmix, Surround Pro Logic (Lt/Rt) emulation:



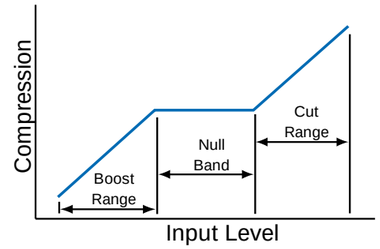
5.1 Downmix, Lo/Ro (stereo) emulation:

5.1 Downmix, mono TV Speaker emulation:



Dynamic Compression Modes

Dynamic Compression Modes allow the user to select the compression characteristic that will be applied to the Dolby Digital bitstream during decoding. During decoding, these modes improve the listening experience in situations where full theatrical dynamic range is not desirable. The DP562 includes four Compression Modes that enable the unit to emulate the compression characteristics found in any consumer decoder. The proper setting of the Dialogue Normalization parameter during encoding determines the Null Band where the signal is neither boosted nor attenuated. Refer to the ***Dolby Digital Professional Encoding Manual*** for more detailed information.



- **None**
  A professional mode (i.e., not available on consumer decoders), no compression and no dialogue normalization. An 11 dB attenuation is applied to the digital outputs during downmixing to protect against digital overload.
- **Custom**
  A professional mode (i.e., not available on consumer decoders), adjustment of low and high-level scaling of dynamic range compression parameters is allowed, enabling and disabling of dialogue normalization is allowed. An 11 dB attenuation is applied to the digital outputs during downmixing to protect against digital overload.
- **Line**
  A consumer emulation mode, dialogue normalization is always on, adjustment of low-level scaling of the dynamic range compression parameter is allowed, adjustment of the high-level scaling of dynamic range compression parameter is allowed except during downmixing.
- **RF**
  A consumer emulation mode, dialogue normalization is always on, dynamic range compression and heavy compression are always on.

To activate high and low level scaling as appropriate, hold down the Dynamic Compression Mode (Custom, Line, or RF) for three seconds until the scaling menu appears. Refer to Section 4.4 in the ***DP562 User's Manual*** for more information.

Latency

The difference in time between a valid Dolby Digital frame entering the DP562 and output of the first PCM sample represented by that frame is known as **Latency**.
The decode latency values for Dolby Digital recorded in AES/EBU streams are:

	Professional Bitstream Latency	
Sample Rate	**Disabled/Reference Detect Modes**	**Silent Switch Mode**
48 kHz	32 ms	38.6 ms
44.1 kHz	35.7 ms	42.8 ms
32 kHz	48.4 ms	58.3 ms

In **Disabled** and **Reference Detect** modes, the latency is one sample frame, while in **Silent Switch Mode**, there is approximately 7–10 ms additional decoding latency to minimize audio artifacts during bitstream switching. Latency values for consumer bitstreams in disabled or reference detect modes are dependent upon both the sample rate and data rate. Consumer latency values are identical to professional latency values in silent switch mode.

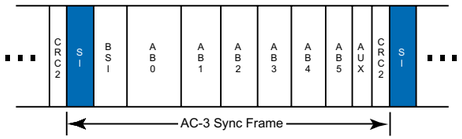
Listening Modes (Downmixing)

The three Dolby decoding modes support five listening, or downmixing modes, selected through the five front panel buttons. A simple button push selects the desired downmixing mode.

- **Full**: All channels (dependent upon input channel mode and decoding mode selected) are reproduced in their appropriate location.
- **3 Stereo**: The left surround signal is sent to left front speaker and the right surround signal is sent to right front speaker.
- **Phantom**: The center channel signal is sent to the left and right front speakers.
- **Stereo**: The left surround signal is sent to left front speaker, the right surround signal is sent to right front speaker and center channel signal is sent to the left and right front speakers. The LFE channel is not included.* The level at which these signals are combined can be controlled in the Dolby Digital encoder.
- **Mono**: All channels signals are sent to the center speaker. The LFE channel is not included.*

**When decoding Dolby Digital bitstreams, if LFE MONITOR MODE in the setup section is set to "AUTO" (factory default), the Low Frequency Effects (LFE) channel will be muted when "Stereo" or "Mono" listening modes or "Pro Logic" decode mode are selected. LFE channel information may only be distributed to the front left and right speakers when appropriate bass management is selected in the setup menu.*
Refer to the ***Dolby Digital Professional Encoding Manual, www.dolby.com/digital*** for more detailed information.

Dolby Digital Bitstream Basics



At the heart of the Dolby Digital (AC-3) bitstream is the synchronization frame. Each single sync frame is self-contained, i.e., all data necessary to decode each frame is present within each frame, and it is the smallest component of the Dolby Digital bitstream capable of being decoded. Each sync frame is made up of a sync information header, a block of bitstream information, six blocks of audio data, a block of optional auxiliary data, and a redundancy check word. Each audio block represents 256 new PCM samples, thus each Dolby Digital sync frame represents 1536 samples.

- **Sync Information (SI)** contains the first CRC word, a sync word, the sampling frequency, and the frame size, needed to acquire and maintain bitstream sync.
- **Bit Stream Information (BSI)** data includes the number of channels coded, dialog level, language code, and service type information.
- **Audio Block (AB)** portion of the frame consists of the six blocks of audio data. Information needed to decode blocks can be shared among a number of blocks, and that information is only encoded in the first block where it is used. The decoder uses that same information again to decode later blocks as appropriate.
- **AUX** block data is used for any information remaining in the frame after the last audio block.
- **Cyclic Redundancy Check (CRC)** The sync frame contains two error check words, one for the first 5/8 of the frame, and a second for the entire frame.

Refer to the ***Dolby Digital Professional Encoding Manual***, Appendix A, ***www.dolby.com/digital*** for more detailed information.

Bitstream Detection

Reference: The decoder senses the input signal and automatically selects the decoding mode. When input signals switch between Dolby Digital and PCM, the switching occurs within one sample frame and therefore may create audible artifacts.
Silent Switch: Same as above but there is a 7–10msec delay in switching to minimize audio artifacts.
Disabled: A manual mode that allows the user to choose the decoding mode. Care should be used when selecting decoding modes manually as speaker damage may occur if an inappropriate decoding mode is selected.
Refer to Section 5.6 in the ***DP562 User's Manual*** for more information.